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ABSTRACT

The research reported in this symposium paper attempts to underline a Piagetian distinction concerning object concept which has tended to be ignored by psychologists working along Piagetian lines. More specifically, this research tested the hypothesis that intellectual development plays a role in the development of stranger reactions. The subjects were 32 middle-class infants from 31-57 weeks of age, with four boys and four girls in each of the four age groups averaging 32, 40, 48, and 56 weeks. The observed behavior of the infant in the presence of a stranger was classified into three main categories; positive, negative, and mixed reactions. Responses were coded +, -, or 0 along the following dimensions: fine and gross motor activity, facial expression, and vocal behavior. The comparison between the results obtained on the human object scale and on the causality scale were coherent with Piaget's theory, which holds that the premanency of the object is the fundamental concept which determines the notions of space, causality, and time. (CS)

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# PERCEPTUAL CONSTANCY AND OBJECT PERMANENCY[1]

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In the last decade, Piaget has become extremely fashionable, incredibly so when one thinks of the long period of silence that followed his first book, published exactly half a century ago (Le langage et la pensée chez l'enfant, 1923). This "engouement" has brought forth in 1973 a strange state of affairs for, to quote Pinard and Laurendeau:"Piaget's difficult system has become enveloped in an aura of prestige irreconciliable with the critical spirit necessary to avoid confusion between hypotheses, opinions and facts" (1969, p. 121). It appears that we are to-day in the rare situation where the monumental work of a genius (recognized as such and still amongst us) is universally read, discussed, experimentally tested and extensively applied[1], but remains nevertheless, as Flavell (1963) has put it, underassimilated.

How can one explain this underassimilation? Many reasons have been advanced such as the magnitude of Piaget's work, its specific vocabulary, the high level of conceptualization of the system, the vagueness and extension of some key-concepts (such as schemes, accomodation, equilibration, etc...) In fact a perusal of Battro's (1966) "Dictionnaire d'épistémologie génétique" leaves no doubt that the "piagenetic language" (Piaget, 1964) is a difficult one.

To all these reasons, I believe that one should add the simple fact that Piaget wrote in French at a time when developmental psychology was largely a German-or-English language discipline. Of course there were translations, but initially there was a considerable delay between the original publication and its translation, and the chronological order of the publications was seldom respected. For example, La formation du symbole chez l'enfant was first

published in 1945 yet it was translated six years later, under a misleading title[2], and before The origins of intelligence in children (1952) and The construction of Reality in the child (1954b), thus reversing the original order of the French publication in spite of the fact that these books should be considered as volumes I, II and III of a single work. "Together these three works form one entity" (Piaget, 1948, p. IX).

To-day the delay in translating Piaget's writings is considerably reduced. However for those who cannot read the French texts the language problem still exists. Some of Piaget's terms are extremely difficult to translate: "schèmes" becomes schemas, or schemata, or schemes, revealing an indecision on the part of the translators[3]; the terms "opératoire" et "opératif" are translated by "operational" and "operative", operative is satisfactory but operational corresponds to the French "opérationnel" and has a different meaning than "opératoire"; "représentation" sometimes become imagery, etc. etc... Other terms remain untranslatable (e.g. "décalage").

The last reason for underassimilation that I would like to stress will lead us to the core of this paper and can best be illustrated by a story. A few years ago, during one of his frequent visits to Montreal, the Canadian Broadcasting Corporation asked Piaget for a T.V. interview. He accepted, but became rather annoyed just before broadcast time because he had been told not to smoke his pipe. The "patron" was waiting, without a smile, for the first question. The young interviewer was tremendously earnest and had gone to the trouble of reading some of Piaget's book on sensori-motor intelligence and concrete operational thinking. His first

question was an introductory statement: "Monsieur Piaget, you are a child psychologist". Piaget, who had kept his pipe, said: "No". There were a few seconds of silence which seemed to last for minutes. The young man gathered up all his courage and started again "Monsieur Piaget, you are a child psychologist", a few puffs of smoke and again a laconic "No". The cameraman did not know on whom to focus, the silent old man or the blushing interviewer. Finally, Piaget said with a twinkle in his eyes "Je ne suis pas un psychologue de l'enfant, je suis un psychologue de l'intelligence". And he went on to explain what he has said repeatedly in the last decades, that he is an epistemologist and that for him developmental psychology has been but a detour. Indeed a fruitful detour that has yielded enough books and articles to keep us busy for a lifetime!

It is probably the differences in aims and in background between an epistemologist and a child psychologist, that explain why Piaget has remained so foreign to many developmental psychologists. They can no longer afford to ignore him but they have a strong tendency to cut him down to size, to narrow his theory so that it fits their own aims or training.

I will attempt in this exposé to do two things; first, to underline one of the distinctions essential to Piaget the epistemologist which seems easily forgotten, neglected or ignored by psychologists working along piagetian lines on the object concept; second, to show how this very distinction has been the point of departure of our latest experimental study on object concept. May I introject immediately, before sounding too pedantic and over-critical of colleagues who have worked on the object concept and for whom I have great respect that, if I do not agree with "le patron", that the only Piaget revisionist is Piaget himself. I do feel however that in research

one should always "annoncer les couleurs", that is one should clearly elucidate both the opinions of the author one wishes to infirm or confirm and one's own opinion. Gilson, the French philosopher, expressed this very well when he wrote: "a good disagreement... is better than the semblance of agreement amidst confusion..." (1939, p. 7).

## - PART I -

One important distinction that Piaget frequently makes is the distinction between perception and intelligence. In part III of The mechanisms of perception (1969), Piaget has carefully analysed the differences, similarities and relationships between the structures of perception and those of intelligence. He describes fourteen differences between the two, some originating in the relations between subject and object, others relating to structure as such. In so doing, Piaget readily admits that he exagerates the differences and goes on to underline the similarities (or partial isomorphisms) between perceptual and operational structures. He finds that during the growth of intelligence, there exist grades of differences and common elements that have to be inserted between the extreme forms of the 14 differences previously emphasized. Piaget concludes by rejecting the hypotheses of a direct filiation between perception and intelligence by which percepts would lead to concepts, or notions simply grow out of perceptions, and he adopts instead the "interactionist" point of view. His hypothesis suggests the existence of an intricate, indirect filiation between perception and intelligence that would extend "by a series of steps, from sensori-motor regulations, which would of course include an integral perceptional component, to reversible operations. But the progress of perceptual regulations towards semi-reversibility would be seen as deriving from, rather than a cause of, the central pro-

gression from actions to operations" (1969, p. 308 and 309).

In other words, at the level of sensori-motor intelligence the piagetian theory postulates an autonomous development of intelligence through schematized activities. The activities of the initial sensori-motor schemes (that can in no way be reduced to the five senses, the visual scheme is not identical to vision, the prehension scheme not identical to manipulation, etc.) first come into play immediately at birth,as do the perceptual activities, and though they bear inevitably on the same events "these schemes exceed the boundaries of the perceived event" (1969, p. 295). Thus the development between intelligence and perception is conceived as being reciprocal (a very particular kind of circular reaction...), with perceptual activities themselves being only a variety of sensory motor activity so that it is likely that they are subordinate from the very beginning to sensori-motor activity as a whole.

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In the case of what is alternately called object concept, object permanence or object permanency, this theoretical interpretation constitutes a crucial point. It means that the notion of object is inexplicable on the basis of perceptual constancies alone. In other words, one must distinguish between <u>object constancy</u> - if by that one means, the perceptual constancy of size and form and <u>object permanency</u> - if by that one means the Piagetian object concept. We all know that to acquire the status of objects, <u>things</u> must not only maintain their own identity whatever the changes in position but also be <u>conceived</u> as permanent, substantial, external to the self, and firm in existence even though they do not directly affect perception" (Piaget, 1954).

Perceptual activities can give birth only to percepts and therefore to a universe of things (Piaget, 1957, p. 74n); it is the schematized activities that give birth to concepts and therefore to a universe of objects. Concretely then, how do these differences present themselves?

The conservation of one property of an object when others are transformed is the hallmark of all perceptual constancies. The real size of an object continues to be perceived in spite of changes in its apparent size, the real shape of an object continues to be perceived in spite of transformations of its apparent form.

Under normal circumstances, such perceptual constancies are acquired quite early. In the case of the mother, who is as a privileged thing that will acquire the status of true object usually well before all other things, it seems that size constancy - the mother remaining an identity when seen close or from afar, the changes in size being compensated by the distance - and form constancy - the mother being recognized when seen full face, in profile, sitting down, standing up etc. - are acquired by or before the age of five-six months which is the age at which the baby recognizes the mother as such (Laroche et Tcheng, 1963, Caldwell, 1965, Fitzgerald, 1968, Carpenter, 1973, Desbiolles, 1973, Gutz, 1973, etc.). Nevertheless, a recognition of an object by features does not mean that the concept of that object has been attained, for it does not require substantialisation and localisation of the mother when she is not in the perceptual field. To become an object, the mother must be conceived as remaining firm in existence even when she is not seen, smelled, heard, touched and when there are no perceptual cues that could suggests her presence.

If such a "thought" is accessible to the six-month-old child who recognize the mother, how can one then explain his lack of active search when his mother disappears behind a series of screens? Repeated experiments have shown that is not before 13-14 months that the mother, in this sense, is fully conceptualized (St.Pierre, 1962, Décarie, 1966, Bell, 1970, Brossard, 1972).

Thus it seems that the evolution of perceptual and object constancy follows different pathways.

Strangely enough, Bower in one of his many ingenious attempts to refute Piaget's description of the evolution of the object concept also comes to the conclusion that one must distinguish clearly between perceptual constancy (which he calls existence constancy) and conceptual constancy. Working from a different perspective than the researchers who have built scales of object concept (Décarie, 1962; Uzgiris and Hunt, 1966; Escalona and Corman, 1967; Casati and Lézine, 1968) Bower's experiments (1967,1971a,1971b, 1972) appear ambiguous : and in need of replication, but they certainly offer food for thought. After presenting the data of his 1967 study, he wrote: "One possible conclusion to be drawn from these results is that existence constancy as a perceptual phenomenon appears very early. Conceptual constancy, which (...) may be said to be a statement predicated about objects rather than about event which is what perceptual consistancy is, comes late. Further it does not seem to be an extension of perceptual structuring. Indeed it is in opposition to them, one wonders, if it would ever develop if the infant's perceptual system were more efficient at birth. The hypothesis offered above makes the growth of conceptual permanence depend on the existence of a limited perceptual system" (1967, p. 418).

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I do not think that Piaget would accept the second part of Bower's conclusion which runs counter to an interactionist filiation between perception and intelligence, but he would certainly accept the distinction between perceptual constancy and conceptual constancy, and he would probably add another distinction: that of "affective permanence" (1937, 1954a, 1954b).

Affective permanence is a passive expectation of the desired vanished object, without any need at first for perceptual constancy of this object. It would come very early (probably around one month) and in my opinion could often be sufficient to explain surprise or disappointment in the very young infant confronted by the disappearance and reappearance of a moving object. Perceptual constancy which takes into account the size, shape and movements of the object would also come rather early (probably gradually and in a piece-meal fashion between two and four months), but true object permanence would be completed only at the beginning of the second year.

In considering the separate though interelated developments of these three kind of permanency, one must also remember that amongst a world of things, the human being usually the mother, will be first to attain the status of object; his particular precocity being the result of an interplay of mental as well as perceptual and emotional processes. In the first place, the mother is frequently at the intersection of several sensory motor schemes which encompasses much more than the coordination of the visual and prehensive schemes, for though these two are important ones, they are not essential in the growth of the object concept. We know that the blind infant (Fraiberg and Friedman, 1964; Fraiberg, Siegel and Gibson, 1966; Freedman et al, 1969), and the limbless infant (Décarie, 1969), can reach the sixth

stage of object concept.

Secondly, the mother is amongst the things that are bound to contradict certain perceptual rules more often than others, so that in a sense she provokes the activity of the schemes which to be efficient must override the output of the perceptual system. (Bower, 1967).

Last, but certainly not least, she is eminently capable of arousing and retaining affective permanence.

- PART II -

It is with these distinction in mind that we devised our latest study in object concept. The summarized description of this study and the questions that it has not answered will conclude this paper.

Briefly, a long-standing interest in the relationships between affectivity and cognitive development lead me and my research team to explore the ties between an emotional reaction, in this case the infant's response to strangers, and intellectual dimensions such as object concept and pre-causality. Initially, we were intrigued by the well-known fact that there is an interval of roughly three to four months between the perceptual capacity to differentiate between familiar persons and strangers and the appearance of Spitz's badly termed "eight-month anxiety" (1950, 1955, 1959, 1965, etc.). We thought that one of the explanations for this time lag could be found in the infant's new acquisitions in terms of concepts rather than percepts. We reasoned along the following lines: If the infant who has been capable of distinguishing familiar and strange persons for several months, begins to react in a quite

particular way to the latter, might it not be because the stranger has acquired a new meaning? We readily admit that this meaning could be tied to the evolution of a libidinal bond, but this explanation alone does not suffice. For those authors who postulate a relationship between attachment and fear of strangers also note an interval of approximately one month between evidence of attachment to a specify mother-figure and fear of strangers (Schaffer, 1963, p. 183-184; Shaffer and Emerson, 1964, p. 22; Bowlby, 1969, p. 328 etc.).

The specific aim of this research was to test the hypothesis that intellectual development plays a role in the development of stranger reactions. We tried to verify whether there exists a relationship between the stage reached by an infant in his object-concept and his particular reaction when approached by a stranger. Our procedure differs from the procedure employed by Scarr and Salapatek (1970) as to instruments and approach to the child. These authors used the Uzgiris-Hunt scale (1966) and Schaffer's (1966) approach. Our scale was based on the search for a human being (in this case the mother) and we used a modified version of Morgan and Ricciuti's approach (1969). In a parallel study on reactions to stranger and pre-causality (Goulet, 1972), we used both the animate and the inanimate object as the goals of the search.

## METHOD[4]

Subjects. The subjects were 32 infants from 31 to 57 weeks of age. There were four boys and four girls in each of the four age-groups averaging 32, 40, 48 and 56 weeks. The age range within each group was within 15 days of the mean. Most of the infants were the first-born of middle-class families.

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Experimental setting. The infant was seen in his home while seated in a high chair, and in the presence of his mother.

Procedure. During the encounter the infant's responses were dictated by the experimenter (acting as the stranger) into an invisible recorder. A male experimenter worked with half the sample and a female experimenter with the other half. Having completed the standardized approach the experimenter waited for the child to become familiar with him (Ainsworth, 1967; Rheingold, 1969) and then administered the cognitive scales.

The stranger's approach.[5] As mentioned above, the standardized approach of the stranger was a slightly modified version of the Morgan and Ricciuti's approach (1969). It consist of seven steps each lasting 30", except for step 3 which lasts only 15" and step 7 which varies between 45" ane 60". The steps are as follows: 1. the adult enters and stands at a distance of approximately 6 feet from the infant while smiling silently; 2. he remains at the same distance and speaks softly; 3. he approachs the infant silently while still smiling; 4. he stands close to the infant and speaks softly, while lightly touching his hand; 5. he caresses the infant's cheeks and head; 6. he extends his arms to the infant as an invitation to pick him up; 7. he picks up the infant. During steps 4, 5, 6 and 7, the adult softly dictates the observed behavior in the guise of addressing himself to the child.

For statistical purposes, these steps were regrouped into three phases: Phase A (far), steps 1 and 2; Phase B (proximity), steps 3 and 4; and Phase C (touch), steps 5, 6 and 7.

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Analysis of data

The observed behavior of the infant in the presence of a stranger was classified into three main categories: positive, negative and mixed reactions. We used the word mixed rather than neutral, because it seems to us the most suitable word to describe the mixture of positive, negative and embiguous responses which it sums up. Following a methodology akin to that of Morgan and Ricciuti (see Goulet 1972), the responses were coded +, -, or 0 along the following dimensions; fine and gross motor activity, facial expression and vocal behavior.

## RESULTS

1) In terms of global scores, the evaluation of the protocols of the 32 subjects showed that 17 infants were positive, 8 were negative and 7 had mixed reactions.

2) The comparison between the results obtained on the human object scale and on the causality scale were coherent with Piaget's theory, which holds that the permanency of the object is the fundamental concept which determines the notions of space, causality and time. Most of the infants were more advanced along the object scale than on the causality scale.

3) The distribution of subjects in regard to age and the sixth stage of object concept seems more in accordance with Wachs and al. (1971) and Uzgiris' (1969) results than with those of Corman and Escalona (1969).

4) The comparison of the results obtained by the subjects on the human scale and their behaviour in terms of positive, negative or mixed

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reactions to the stranger did not confirm the hypothesis that a certain stage in the object permanency has to be reached before fear of the stranger can appear. These results are similar to those of Scarr and Salapatek (1970).

5) There was found a relationship between the infants' modification or non-modification of their behaviour as the steps of the procedure progressed and the point which they had reached in the Piagetian stages. Fourteen of the 16 subjects whose affective responses changed (as the stranger came closer) were found to be either in stage V or stage VI of object permanence, whereas the children who remained constant in their responses, remaining positive or negative throughout the encounter, were found to be in stages III and IV.

## Conclusion

These results do not allow us to maintain our main hypothesis without qualification, they also contradict Spitz (1950, 1955, 1965), Schaffer and Callender (1959), Schaffer and Emerson (1964), and Bowlby (1960, 1969) who assumed that a certain stage of object permanence must be reached before a negative reaction to strangers can appear. Nevertheless, in our opinion these unexpected results are not due, as Gratch (in press) has stated, to the premature development of object concept scales based on Piaget's theory. When Gratch writes that "The leap* would be warranted if object-concept scale performance were found to have important correlates, but at present, no compelling correlations have been found", he is quite right about the lack of clear-cut correlations, but he does not consider the possibility that the absence of correlations might be due to the fact that the dimension which one seeks correlation with, might not have the developmental significance that the object-concept has.

* (between theory and the construction of the scale)

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The statement certainly appears to be true of the negative reactions of infants to strangers in view of the findings of Rheingold and Ackerman (in press). Moreover a recent investigation by a member of our research team shows that the negative response to strangers is unstable and seriously challenges the belief that the infant's negative response is a developmental milestone (Shaffran, 1973).

The necessity to delineate clearly amongst the countless acquisitions of the first year of life, which ones represent important developmental miletones and which ones are secondary, transitory events, thus appear as an urgent task. It is only when we will have gone through this kind of "ascèse" that we will be able to retain a few essential phenomena and by focussing on them, try to unravel the interplay of perceptual, cognitive and emotional processes that have brought them about.

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NOTES

1. A clear-cut example of Piaget's overpervasive influence was seen in Quebec last December. One of our newspapers featured a half page advertisement for Christmas toys in which the different toys were classified in three categories: 1) jeux d'exercice, 2) jeux symboliques, 3) jeux de règles, that is the three developmental levels of play that Piaget utilizes in Play, Dreams and Imitation in Childhood (1951).

2. The english editor used the subtitle as title, which restricts the scope of the book.

3. Scheme is Piaget's preferred translation (see Piaget, 1969, p. IX).

4. This study is described in more details in Brossard (1972) and the english translation is soon to be published. Listeners may well be frustrated here by the lack of statistics, figures and tables, but they should know that in summarizing this study, I wished only to illustrate how a piagetian point of view can give birth to a simple experimental design and foster discussion.

5. We are now using a different approach based on an experimental study of the natural approach of strangers (see Shaffran, 1972.

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